

REMARKS/ARGUMENTS

Responsive to the Final Office Action mailed January 24, 2005, Applicants provide the following remarks. Applicants believe the present amendment places the application in a condition for allowance or a better condition for appeal. Accordingly, entry of the present amendment and allowance of the subject application, as amended, are respectfully requested.

Amendments to the Drawings

In paragraph 1 of the Official Action, the Examiner indicates that the drawing change filed on November 23, 2005 is not acceptable as including new matter. Applicants respectfully disagree. The proposed drawing changes included only the addition of a transmitter and receiver at opposed ends of the portion the optical communication system shown in FIG. 1A. The specification specifically describes FIG. 1A as showing “an exemplary optical communication system.” Paragraph [0022]. There can be no dispute that an “optical communication system” inherently includes a transmitter and a receiver. In fact, the specification specifically describes transmission systems as including a fiber route between a transmitter and receiver. Paragraph [0004].

Even if the specification did not explicitly include language regarding a transmitter and a receiver, a transmitter and receiver are inherent in the description of FIG. 1A as an “optical communication system” and adding a transmitter and receiver to the drawings does not introduce new matter to the application. This is specifically confirmed in MPEP section 2163.07(a), which states:

By disclosing in a patent application a device that inherently performs a function or has a property, operates according to a theory or has an advantage, a patent application necessarily discloses that function, theory or advantage, even though it says nothing explicit concerning it. The application may later be amended to recite the function, theory or advantage without introducing prohibited new matter. (citations omitted) (emphasis added).

At least for this reason, Applicants respectfully submit that the drawing changes submitted on November 23, 2005 did not introduce new matter.

To expedite prosecution, however, Applicants propose to add new FIG. 1, as shown on the attached Replacement Sheet 1 of 3. New FIG. 1 is fully supported by, for example, original claim 8, paragraphs [0011], [0016], [0035], etc. No new matter has been added.

Amendments to the Specification

Applicants note the Examiner has not entered the amendments to the specification filed November 23, 2005. Applicants have amended the specification to include a description of FIG. 1 and to correct minor typographical errors. No new matter has been added. Applicants note, for example, that the description of FIG. 1 includes language corresponding to the language of original claims 1 and 8.

37 CFR §1.83

In paragraph 2 of the Official Action, the Examiner objected to the drawings under 37 CFR §1.83(a) asserting that the “transmitter”, the “receiver”, the “feedback loop”, and “a plurality of Raman assisted EDFA hybrid amplifiers” must be shown or the feature(s) cancelled from the claim(s). New FIG. 1 shows the transmitter 11, the receiver 12, and the plurality of Raman assisted EDFA hybrid amplifiers 12-1, 12-2...12-N. The currently pending claims do not include a recitation of a “feedback loop.” In view of the present amendment to the drawings, Applicants respectfully request that the Examiner’s objection to the drawings be withdrawn upon reconsideration.

35 USC §112

The Examiner has rejected claims 1-6, 9, 10, 12, 15 and 26-27 under 35 USC §112, second paragraph, as being unclear with regard to the recitation in claims 1 and 26 of the Raman amplifier variable gain portions providing associated gain “whereby each of said EDFA gain portions has substantially the same input power.” Applicants respectfully traverse this rejection.

Applicants respectfully submit that one of ordinary skill in the art would readily understand the meaning of the subject claim language from a simple reading of the specification. In particular, each of the plurality of Raman assisted EDFA hybrid amplifiers has (1) a Raman amplifier variable gain portion, an (2) EDFA gain portion. The gain of each Raman amplifier

variable gain portion is set so that all of the plurality of EDFA gain portions (e.g. the EDFA gain portions associated with each of hybrid amplifiers 12-1, 12-2...12-N) have substantially the same input power, regardless of the span length and loss associated with the amplifier. This is described in the specification in paragraphs [0035]-[0036] and [0039], which state:

[0035] In operation, a ULH system design in accordance with the present invention chooses launch power based on the following span so that optimum power is launched into it. The adjustment is performed by adding loss to the output of the previous EDFA of the Raman assisted EDFA hybrid amplifier, for example, in 1 dB increments. The Raman gain is adjusted either manually or via feedback so that all EDFAs have the same input power.

[0036] With the same input and output power for all EDFAs, a major advantage over the known art is realized in that a single code of preferably single-stage medium gain EDFAs can be used with terrestrial systems regardless of the span loss distribution (within practical limits: e.g., 30-110 km). The EDFA gain and output power, the Raman gain upper and lower limits, and upper and lower loss limits can be chosen for a generation or class of systems without custom design for each amplifier in the transmission path. Another advantage of this design is that it significantly simplifies the gain equalization plan.

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[0039] Thus, one advantage of the present invention is that the preferred system design makes a terrestrial link look and behave like a traditional long-haul or ULH undersea link. One code of (single stage) EDFAs is used with varying output loss to launch the optimum power into each span regardless of length. The Raman gain is adjusted so that each EDFA has substantially the same input power. This concept minimizes system degradation from wide span loss distributions and allows generic repeaters to be manufactured and used in all systems of the same generation (capacity). (emphasis added in each paragraph)

The language in the claims regarding setting the gain of the Raman amplifier variable gain portions “whereby each of said EDFA gain portions has substantially the same input power” would be readily understood by those of ordinary skill in the art. As such, Applicants respectfully request that the rejection of claims 1-6, 9, 10, 12, 15 and 26-27 under 35 USC §112, second paragraph, be withdrawn upon reconsideration.

35 USC §103

Claims 1-6, 9, 10, 12, 15 and 26-27 have been rejected under 35 USC §103(a) as being unpatentable over Onaka. Applicants respectfully traverse this rejection.

Independent claims 1 and 26, as amended, both require “a plurality of Raman assisted EDFA hybrid amplifiers, each having a Raman amplifier variable gain portion, an EDFA gain portion, and an optical attenuator coupled to an output of said EDFA gain portion” wherein the Raman amplifier gain portions provide “an associated gain whereby each of said EDFA gain portions has substantially the same input power.” Applicants find nothing in Onaka that teaches or suggest a system or method as set forth independent claims 1 and 26.

The Applicants comments regarding the teachings of Onaka are provided the response of November 23, 2005. In general, Onaka involves gain tilt compensation, and is devoid of any teaching or suggestion of “a plurality of Raman assisted EDFA hybrid amplifiers, each having a Raman amplifier variable gain portion, an EDFA gain portion, and an optical attenuator coupled to an output of said EDFA gain portion” wherein the Raman amplifier gain portions provide “an associated gain whereby each of said EDFA gain portions has substantially the same input power”, as set forth in independent claims 1 and 26.

The Examiner points to column 4, lines 44-53 of Onaka as providing this teaching. This section of Onaka states:

Moreover, the wavelength characteristic controlling method may further comprise: a power monitoring step for monitoring an output light power of the Raman amplifying medium; and in which the Raman amplification controlling step may adjust proportions of the Raman pump lights at the respective wavelength bands, based on a result of the wavelength characteristic monitoring step and based on a result of the power monitoring step, such that the output light power of the Raman amplifying medium is kept constant and the wavelength characteristics of optical transmission powers are flattened. (emphasis added).

There is simply nothing in this section of Onaka that teaches to control each of a plurality of Raman variable gain portions to provide an “associated gain” whereby each of a plurality of associated EDFA gain portions “has substantially the same input power”, as set forth in independent claims 1 and 26. This section simply teaches to monitor the output of a Raman amplifier and control pump light so that the Raman amplifier provides a constant gain.

To establish a *prima facie* case of obviousness, the Examiner must identify some teaching or suggestion of all of the claimed limitations in the prior art. The Examiner has not identified anything in Onaka, and Applicants can find nothing in Onaka, that teaches or suggests limitations of claims 1 and 26 requiring “a plurality of Raman assisted EDFA hybrid amplifiers, each having a Raman amplifier variable gain portion, an EDFA gain portion, and an optical attenuator coupled to an output of said EDFA gain portion” wherein the Raman amplifier gain portions provide “an associated gain whereby each of said EDFA gain portions has substantially the same input power.” As such, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness and that claims 1 and 26 could not have been obvious in view of Onaka at the time the invention was made. Claims 2–6, 9-10, 12, 15 and 27 depend directly or indirectly from claim 1 or 26 and are allowable by virtue of their dependency as well as for their own limitations. Applicants respectfully request, therefore, that the rejection of claims 1-6, 9, 10, 12, 15 and 26-27 under 35 USC §103(a) as being unpatentable over Onaka et al. be withdrawn upon reconsideration.

In light of the foregoing remarks, it is believed that all of the presently pending claims are in a condition for allowance. Entry of the present amendment and allowance of the application is respectfully requested. In the event the Examiner deems personal contact desirable in disposition of this application, the Examiner is respectfully requested to call the undersigned attorney at (603) 668-6560.

No additional fees are believed to be due. In the event there are any fee deficiencies, please charge them (or credit any overpayment) to our Deposit Account No. 50-2121.

Respectfully submitted,

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